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East Europe Report

SCIENCE AND TECHNOLOGY

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EAST EUROPE REPORT

SCIENCE AND TECHNOLOGY

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CZECHOSLOVAKIA

TECHNOLOGY, NATURAL SCIENCE STUDIES PROMOTED

Bratislava PRAVDA in Slovak 21 Mar 85 p 2

[Text] Yesterday in Bratislava a press conference on current questions of the CPCZ educational policy was held with the participation of SSR Minister of Education Juraj Bus, First Deputy Marta Vlacihova, and other employees of the ministry.

In his speech, the Minister of Education gave a summary of the 40 years of successful socialist education. He underscored the current tasks in implementing the paper Further Development of the Czechoslovak Education and Training System and called attention to the need to increase young people's interest in the study of technology and the natural sciences, to improve the quality of technical expansion in the gymnasia, and to build up the material base and staff of the middle level trade training schools. He also informed the press of preparations for the approaching acceptance of those continuing on to middle level schools. The middle level schools will be taking in 77,000 students of the basic schools, 58 percent of which will be going into middle level trade training schools, not quite 15 percent into gymnasia, and over 24 percent into middle level trade schools. But this year again there is a disproportionately high interest in some middle level schools, such as clothing (200 percent), economic (140 percent), and teaching and medicine (200 percent). Interest in gymnasia drops outside the large towns, especially among young men. The use of computers, which ensures objectivity, has proven itself in the acceptance process for continuing education.

6285
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CZECHOSLOVAKIA

PATENT LITERATURE PUBLICIZED

Bratislava PRAVDA in Slovak 18 Mar 85 p 2

[Article by Jozef Supsak: "The Key to Foreign Inventions"]

[Text] By a systematic study of patent literature, one can gain a thorough overview of the state of worldwide equipment and technology in a given field. It is also possible in this manner to estimate relatively reliably the direction of future development. The employees at state and kraj scientific and technical libraries (there are 13 of them in the CSSR) point out that the opportunities are not being fully exploited which these extensive stores of documentation on inventions offer. One of the problems is the language barrier. Descriptions of inventions are entered into the Czechoslovak information system in their original form. For many of our engineers and technicians, the information channel is closed for this simple reason. The Central Patent Literature Library in Prague-Bubenec offers a certain solution. It regularly gets the very well designed and produced journal INVENTIONS in the USSR and abroad from the USSR. It is broken down into 116 groups, each of which brings together inventions in a single technical field. The Russian language, which is a close relative and understandable for our scientific technical worker, can be the key to a rich source of information. One should not forget about this possibility in the economic production units, enterprises, and institutes of the research and development base. A thorough overview of the results of research and development in the world is the first prerequisite for not inventing something that has already been discovered.

6285
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GERMAN DEMOCRATIC REPUBLIC

INSUFFICIENT EQUIPMENT, MATERIALS SEEN HOLDING UP R&D

East Berlin SPECTRUM in German Vol 16 No 4, 1985 pp 1-3

[Article by Werner Lange, GDR Academy of Science member]

[Text] In the final analysis, all deliberations concerning the interaction between research, technology and production lead to the question of how to find new scientific solutions. The problem of creative work is in the center of every further technological development, the material bases of which must be created by the effective use of the available technology.

The significance of scientific work for the development of production and equally the significance of production as a basis for satisfying the scientific and individual needs--these facts are recognized today as self-evident and are unopposed. Still, sometimes considerations as to how everything works together and should be arranged do not get adequate attention. However, the effectiveness of research, technical development and production and also the produced goods themselves depend on the correct understanding and the examination of the various and sometimes complicated interrelations. Therefore, an attempt is made to present some of the essential relationships proceeding from the basis that natural sciences, technological sciences and essential parts of social sciences are closely related to technology and the production it supports.

When studying the effectiveness of the technical production environment we find two closely related problem areas. The first one concerns the task of keeping in order and using the present technical world. This is not only--and frequently not even primarily--a technical problem, although questions of intensifying and streamlining present technology is an essential part of this task. However, the continuing supply of energy, raw and auxiliary materials and intermediate products of sufficient quality, for instance, can become a determining factor for efficiency. The second problem area concerns the further development of the technical world with the objective of increasing efficiency and scope of production and to satisfy new demands, which arise or can be met sometimes only on the basis of newly created technical possibilities.

It is in the nature of things that the standards for an efficient use of present technology and its further development as well as the resulting measures taken depend on the social conditions. In the capitalistic economy, disproportions caused by technological development and frequently characterized as structural crises as well as all fluctuations inherent in the system are offset to a large extent by the number of workers used in production. Thus, a labor reserve is inherent in the system. The fate of the steel industry in the capitalistic countries shows to what extent profit as a primary standard can cause an erroneous economic development as a consequence of a technological development which is positive in itself. The profit obtainable cannot be a standard for us.

Elastic Response

Socialism guarantees a workplace for everybody, i.e. it ensures social security. The solution of this task without hindering work productivity and work morale poses particular challenges. The necessary reserves must be available, both with regard to materials and capacity, to safeguard a dynamic development and the elastic response to a changed sitation which is required towards this end as well as for balancing unpredicted or unpredictable development fluctuations. Here, the reserve is an element of careful budgeting. It is the joint task of both social scientists and engineers to find arrangements which permit steady production.

However, for maintaining the proportions of the national economy it is even more essential to think through on a long-term basis the desired and feasible production development. Accomplishing this task is a definite characteristic of the socialist economy and nothing new for us after 35 years of planning work, however, the progressing development also poses new challenges which result not least from the development of the production technology.

Differentiating between the available and producing technology and the new, future technology makes sense when we are concerned with measures to safeguard and increase stability and efficiency of current production. However, this is no longer so obvious when an attempt is made to relate measures for technical development and the related research required to the technology which is currently available or which must be newly established. The scientific and technical bases required are largely identical. A difference becomes apparent when a completely new principle was found and is to be put to use. Even then, the old technology should be considered in many ways. A few examples will explain the relationships described.

Integrate the New into the Old

By far not all instances show the cause-effect relationship so clearly. This applies, for instance, to the areas of corrosion and friction, wear and tear, lubrication. Constant work in these areas had become an urgent task in particular at the start of the industrial development. As a result, all potential new scientific and technical possibilities were tested for their

suitability for bringing about new technial solutions. For the second item mentioned above this refers to the development of suitable materials, in particular the improvement of their surface properties, for instance, by chemical and thermal coating procedures or radiation procedures. It includes the development of appropriate lubricants, but also design measure as can be seen most clearly in the development of roller bearings which are produced with increasingly greater precision. Modern technology is unthinkable without the variety of proven solutions, and the user of the products is often not aware of this. However, in case of a failure he realizes that even with the most modern products increasingly better mastery of the technical solutions which are old in terms of function is indispensable.

It has already been pointed out that the technical utilization of a completely new solution principle results in a more complicated situation than if existing technology is developed further. The work to master the new must be combined with integration into old technology or its adaptation to the new technical possibilities. Looking at technological development and high-level evaluation from a historical perspective it can be noted that such events are relatively rare. For ancient times, the invention of the wheel may serve as an example; for the development around the turn of the century, the technical utilization of electricity is another example. Today, microelectronics, the development of which was started with the discovery of the semiconductor effect, plays such a role. It transforms the actor in the production process to a controller of the process. The question to what extent, in what form and in which areas this transformation of human work into machine work makes sense and is economical, will certainly occupy us for decades.

The utilization of the scientific-technical progress for a rapid and effective increase in production requires the establishment of arrangements which correspond to these objectively acting factors. This starts with evaluation standards for meeting the daily tasks and ends with thinking through the social development and the development of production and its technology on a long-term basis. There must be a guarantee that the objects of technical developments which were selected according to the capacity available can be implemented safely in addition to a continuously running production. This will not be discussed further here, however, we will deal with the question of how an improvement in working conditions and working prerequisites would improve the efficiency and creativity of scientific-technical work.

Ideas in Demand

One of the most obvious requirements is the speedy completion of tasks, be it in research itself or when converting it to the technical standard. Work progress and success largely depend on how quickly one can respond, i.e. take the next steps, based on the new knowledge gained. Such situations are directly related to the work towards new technical solutions, to testing their capabilities and feasibility in laboratory experiments, on a small technical or technical scale. The more progressive and thus the more risky the ideas are, the more likely it is that one must respond to knowledge gained by experimental work. If the preconditions for this do not exist or if they can be created only in too long a period, which may be set, for instance, by the planning rhythm, then valuable time is lost and potentially the value of the

result is reduced. By overcoming structural ideas not related to practice, the resolutions and measures for the creation of means for improving efficiency are an essential contribution to making the new technology effective more quickly. The difficulties when producing the so-called small-tonnage products which still arise, the "thousand small items" also needed in research and technology or the deficiencies in the manufacture of equipment of which only few units are required illustrate problems which have not yet been solved satisfactorily. By developing equipment production the academy contributed positively to the solution of this task.

All examinations of the diverse interrelations between research, technology and production finally lead to the question which determines the level of development, how to find starting points for finding new scientific knowledge and new technical solutions, i.e. the problem of creative work. Here, too, favorable conditions can be created. In addition to developing individual capabilities, in addition to the comprehending and processing capabilities the finding of new solutions is promoted by bringing together knowledge and experience and the related multiplication of the combination and associative possibilities. Chance and the recognition of solutions that can be derived from it can serve as important starting points. However, it is equally important to avoid everything that restricts the possibilities of creative work. For the creativity-promoting factors mentioned to take effect in many areas, the establishment of large research complexes proved to be useful. However, management of these complexes also requires taking into account these factors. Where material conditions do not permit such a solution, this interaction must be achieved by promoting good contacts among the various research and production institutions. However, there are areas where the necessary work efficiency is hard to obtain without institutionalizing the coordinating function. Such an area is safety technology. Mathematicians deal with special mathematical methods of reliability theory, mechanics with questions of stability and others with problems of early damage recognition and technical diagnostics. However, an intellectual combination of all partial disciplines of this so very important area by interdisciplinary cooperation, which can also lead to completely new solutions, does not come about to the extent possible and necessary. Starting points for such a complex safety concept exist for nuclear technology, due to the significance and urgency of this area.

Excerpt from a presentation given by academy member Werner Lange to the plenary session of the academy in December 1984.

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HUNGARY

POLITBUREAU REPORT ON ACHIEVEMENT OF SCIENCE POLICY OBJECTIVES

Budapest MAGYAR TUDOMANY in Hungarian No 4, 1985 pp 260-277

[Article: "Status Report on the Realization of Science Policy Guidelines, Discussed by the Political Committee of the Hungarian Socialist Workers' Party at its 29 January 1985 Session"]

[Excerpt]

I.

1. The level and effectiveness of domestic scientific research as a whole correspond to the economic and technical development level of the country and surpass it in a number of branches of science -- according to comparative data. Outstanding results have been achieved in mathematics, elementary particle and solid body physics and in molecular and medical biology -- among other things. Hungarian researchers have achieved internationally recognized results in the areas of computer science and pharmaceutical research. But mediocre research activity has also reproduced itself -- lowering the rate of average. It is disturbing that in some branches -- especially in the area of technical sciences -- there are few outstanding achievements and the practical utilization of the existing achievements is not satisfactory.

Research and development activity aimed at immediate economic goals has increased somewhat and there has been an improvement in corollating the decisions and the utilization of the R&D achievements. The expenditures for research and development themes with immediate economic goals make up nearly 80 percent of all expenditures. The R&D institutes receive 80 percent of the research expenditures within the framework of concrete orders (contracts, commissions) and the faculties receive 40 percent of their research expenditures in this way. Each year the research sites produce instruments, equipment and materials worth several billion forints and they provide various services.

The effective linking of technical or technological research and industrial production has been stepped-up in some branches -- computer technology, the nuclear industry -- but this has not yet become characteristic of industry as a whole. Types developed in research institutes make up only a small proportion of the new products. The developmental activity performed by some enterprises on their own has become more effective for some and as a result a few products have been created which represent a high level even by

international comparison. The economic motivation for enterprises' technical development is growing -- although more slowly than we would like. However, the degree of introduction of modern processes of fundamental significance, the age composition of the product structure and the level and effectiveness of manufacturing and product development activity are not satisfactory. One can expect a significant change in this area only from an increase in the material interest of the enterprises in research results and technical novelties and from a considerable intensification of the "drawing power" of new achievements.

Agricultural research has become one of the determining factors in the effectiveness of agriculture. The result-oriented nature of agricultural production creates favorable conditions for making use of scientific achievements. New types of enterprises have developed, R&D associations that link every element of the innovation process in agriculture. The industrial type production systems make the quick, efficient and massive use and spread of the newest S&T achievements possible. However, the biological orientation needs to be better implemented and the ratio of R&D development themes aimed at reducing production costs increased.

Research in social sciences has started paying more attention to timely questions on the development of society and economy; the participation of researchers in preparing political decisions has increased. They have undertaken significant tasks in preparing the decisions pertaining to the development of the economic management system, the modernization of public administration and the directions of urban development. The role of the social sciences in molding social awareness, public opinion and ideological and cultural processes has increased, but still is not satisfactory. At the same time one can observe signs of deideologization, of increasing theoretical uncertainty. Certain bourgeois ideological systems have become more influential, which is partly the result of the fact that an analysis of some of the new phenomena and problems on Marxist-Leninist basis has been delayed.

The system linking politics and science has been expanded and reinforced to a significant degree in the past period. In the course of preparing decisions the political leadership makes use of the cooperation of individual researchers, scientists and expert committees and regularly asks for the opinion of scientific bodies concerning the more important economic and social policy questions. The foremost social science research programs have contributed to a more realistic understanding of our socio-economic relationships, to discovering and resolving tensions. However, their participation in working out concrete solutions is not satisfactory.

2. Following the 28 June 1977 science policy resolution of the Political Committee the rapid quantitative growth of the research base has slowed down and then from 1980 on the size of the base has decreased and a transformation of the structure accelerated as a result of organizational measures. Enterprise R&D sites have expanded somewhat while the ratio of independent research institutes has decreased; 80 percent of the enterprise research base is concentrated in the organic chemical industry, the machine industry, the electronics and computer technology industry.

No basic changes have been made in the development of the research institution system of higher education in regard to either quantity or quality. Its scattered nature persists, the faculties are isolated from one another and from the research institutes.

As a result of the process started within the framework of the research institute reorganization, there have appeared organizations which facilitate the introduction of research results, and these have developed dynamically. They include technical development enterprises and various organizational, planning, developmental and marketing enterprises. Advantageous financial regulations have helped them along. But a change in activity has not always followed the change in organizational form.

For the time being the reclassification of a significant number of research institutes as institutions of other types has brought few real changes because the supervisory bodies have not implemented the consequences of the changed scope of tasks when determining the size and the concrete tasks of the institutions.

No results were achieved when framework institutes [keretintezet] -- an organizational form to increase researcher mobility -- were created; their implementation foundered on the limited social conditions, on the resistance of the research sites that were affected and on the apathy of the interested administrative organizations.

The high concentration of research networks in Budapest has been only slightly reduced. Even now two thirds of those doing R&D work are working in Budapest.

The role of outside contract commissions has become the determining factor in maintaining most of the research institutions. This fact -- together with its indisputably positive effects -- also causes certain problems in the activity of the institutions, especially at the R&D institutes. Some places are preoccupied by taking and filling orders, scientific value is forced into the background, and the internal atmosphere does not sufficiently encourage scientific creativity. The internal operational, interest and organizational systems of some institutions are only slowly adapting to the changing circumstances. More recently, corollating the activities of the economic work associations that are established at the research sites with the basic activity of the institute and with the contract jobs is causing problems in some areas.

3. In 1980 the total number of people working in the area of R&D -- in research institutes, at enterprises, in faculties, in public collections -- reached a maximum with more than 85,000 people, 37,000 of whom were researchers, faculty instructors or engineers working at enterprise research sites. Since then the number has decreased to 78,000.

The ratio of researchers in relation to the population of Hungary is smaller than in a few socialist countries, but greater than in the majority of the smaller capitalist countries. As a whole an increase in research personnel is not justified in Hungary in the decade ahead.

A situation which would direct creative people to research work, to a research career and direct incompetents to other careers, has not been produced by demanding performance and providing material interest. A defense of mediocrity can even be found among researchers and leaders -- something with especially dangerous consequences in this area. The efforts of recent years have resulted in only insignificant movement, primarily within the area of research and primarily among the young. Hiring fresh graduates to take the place of those retiring has become virtually the only form of cadre exchange, so that the opportunities for young people to get in have slowed down. During 10 years the ratio of those over 50 years of age has increased from 13 percent to 21 percent, and the ratio of those under thirty has decreased. The average age of researchers -- 40.1 years -- has increased by 1.5 years in recent years. The interest of young people in a research career has declined.

The number of young contract researchers employed part time for a long period under unusually unfavorable material conditions has increased in the area of the social sciences. The increased difficulties of getting ahead are coupled with the lack of feedback concerning the value of their accomplishments, and all this causes a lack of perspective and poor teamwork among them.

Introduction of the uniform researcher requirement system has improved the effectiveness of cadre work to a certain extent. In principle there are more opportunities for real supervision of the work of researchers. The number of researchers who know foreign languages has increased, but is still far from adequate. Only about 65 percent of the researchers -- less than half of those working in enterprise R&D sites -- have good enough knowledge of a foreign language to at least study the professional literature.

The salary relationships of those working in R&D do not adequately reflect their training and performance. The salary structure neither allows adequate recognition of high level creative activity nor rational management of manpower trained at different levels. Individual advancement depends more on age and meeting the formal requirements than it does on real successes. Tensions have also arisen between different areas. Research institute wages still lag behind those in higher education, while the latter do not reflect adequately the social significance of educational and research work done in colleges and universities. The disproportionately large number of instructors compared to the number of students results in a leveling of wages at a low level. As a result of this a significant number of those working in R&D are forced to turn their creative energies, in part, to earning additional income. In many cases this endangers the quality of research work and the level and effectiveness of the activity done on the main job.

The ratio of those with candidate's and higher degrees (13 percent) has not changed essentially. Another 17 percent have university doctorates. The average age of the candidates is 48 years. There has been a further development of the scientific qualifications and university doctorate system in recognition of the unfavorable trend. The new rules make it possible to begin advanced scientific training immediately after completing one's university studies, thus providing better coordination of activities aimed at obtaining a candidate's degree or the title of university doctor.

In a number of cases the professional requirements are not realized consistently in the course of appointing directors. Not enough experienced experts sensitive to science but also acquainted with practice have been appointed to head industrial research sites. "Internal cultivation" is a major concern in the universities; only rarely do university instructors come in from outside -- primarily from practical work. No acceptable practice for stepping down from a leadership position without loss of prestige has been developed.

The research institutions must prepare for a generational change in their upper and mid-level management in the years ahead. The problem is that in many areas there are no leader replacements with adequate leadership experience and scientific qualifications standing behind the ranks of researchers who achieved leadership positions at a young age in the period following the liberation.

One third of the researchers go abroad once or more often each year for scientific purposes. A number of outstanding Hungarian scientific achievements have been attained while working abroad or as a result of having done so. Easing the system for authorizing work abroad for scientific purposes has had a good effect on public opinion. Getting experience abroad and increasing the good reputation of Hungarian researchers both have positive results. But in the future it may represent a danger in a few areas that the most talented members of the young generations undertake to work abroad for long periods, and fewer and fewer strands tie them to domestic scientific work.

4. The growth in R&D expenditures has resently slowed down. Between 1970 and 1977 the ratio of resources, compared to internal use of national income, increased; between 1977 and 1982 it stagnated; and it decreased to a significant degree in 1983.

The ratio of our R&D expenditures compared to national income places in the middle of the field for European socialist countries and the ratio, compared to the GNP, is greater than for the majority of European developed capitalist countries. Expenditures per capita, however, come to one half or one third of the R&D expenditures used in the majority of the developed capitalist countries in Europe.

Research and technical development expenditures at current prices increased continuously until 1982, and in 1983 decreased by about 5 percent. The picture is less favorable if we consider price changes; even up to 1982 the expenditures decreased by 2.5 percent per year in real value. It is an unfavorable feature that the ratio of budgetary resources within expenditures is continually decreasing. The ratio of basic research declined as a result of this -- from 14.3 percent in 1970 to 11.6 percent in 1982 -- and the share of medical and agricultural sciences declined. Between 1976 and 1982 the ratio of social sciences expenditures compared to internal use of national income fell from 2.11 per mille to 1.11 per mille.

The decline in R&D investments is an especially dangerous tendency; this decline is of greater magnitude than in the economy as a whole. The ratio of investments within national economic investments has continuously declined

from 1.88 percent in 1970 to 1.67 percent in 1975 to 1.42 percent in 1983. As a result the up-to-date status of the assets base has deteriorated in the relative and absolute sense, and the ratio of live work has increased. The state of the large instrument park and technical infrastructure which crucially determine the level of research are cause for alarm at a time of extraordinarily rapid growth in the technology demand of research activity which can be experienced throughout the world. A critical situation has developed in some places, especially in the research sites supported by the budget and in the area of higher education. The amount of foreign exchange which can be turned to acquiring instruments, parts and journals has decreased in recent years. The problems deriving from this have been made worse by the excessive bureaucracy and some poorly planned measures in the use of the allotments.

5. In recent years research management -- due to the further development of economic and social directives -- has constantly modernized its methods.

a. The basic structure for national planning of R&D was developed in the Sixth 5-Year Plan. The long-range research plan, the medium-range research and development programs, the industrial and technical development priorities built into economic planning are more and more closely linked. Even now, however, one can experience considerable parallelism, overlap and guideline inconsistencies among the plans and research and economic development programs at various levels and with various goals. The administrative authorities have not been able to resist adequately the research site and enterprise demands aimed at special treatment, and this has reduced the effectiveness of selection.

Within the framework of the national R&D plan adjusted to the Sixth 5-Year Plan we have succeeded for the first time in creating a closer link between thematic and financial planning. But very many formal, bureaucratic elements were realized in the administration of the programs and it was not possible to ensure adequate flexibility and operativity or good cooperation among the financing bodies (ministries, the National Technical Development Committee and the enterprises).

In addition to the positive experiences it is an ever more evident unfavorable aspect of the planning system for the social sciences and of the research organization practice adjusting to it that the number of important themes in this area especially is increasing too much, they are spreading too much and consequently, once underway, their control and modification are impossible.

b. The financing system for R&D activity has been modified. The basic goal of the modification was to orient the R&D towards financial tools and to provide material incentives for using research results and for carrying out national programs.

A competition system was introduced to expand resources for university research and for basic research done in other institutions. In part central resources and in part some of the ministerial funds were used within the framework of the competitions. In general the experiences with the system of competitions are favorable.

The generation of a central reserve -- 10 percent of the centralized technical development funds -- in the Sixth 5-Year Plan is aimed at increasing the flexibility of management and expanding its freedom of movement. The central reserve will make it possible to finance new national programs and individual tasks appearing at certain times and to reduce certain tensions, for example, in connection with any sudden worsening of conditions for basic research.

Significant changes have been made in regulating the generation and use of the technical development funds serving to finance R&D activity with an immediate economic goal. Changing the projection base, the generation keys and the scope of generation is aimed at developing a more flexible financing system giving the enterprises greater independence. The effect of the changes will be seen in the first half of 1985.

The effectiveness of the centralized technical development funds use is still not satisfactory. The excessively bureaucratic system of distributing central resources, tied to formal requirements, has not been reduced to an adequate degree. The development of bank financing forms for technical development has begun.

As a result of the further development of the financing and management system for research and technical development it is expected that the generation and utilization of resources will better serve the concentration of resources and their more effective use. It represents significant progress that in many places an effective task financing has replaced institutional financing. The method of financing technical development, however, still does not adequately encourage efficient management of resources.

The increased demand by enterprises for technical development depends primarily on the extent to which economic conditions force the enterprises to introduce new procedures and products. Only rarely so far have changes in certain elements of the regulatory system aimed at technical development been made or incentives introduced, for example, in the case of introducing licenses.

c. The institutional system for guidelines has continued to develop. Adequate cooperation has developed among the central organizations playing a role in the administration of research and technical development -- the Science Policy Committee, the Hungarian Academy of Sciences and the National Technical Development Committee.

The Science Policy Committee has carried out administrative tasks at the government level effectively. Its role was expanded in accordance with the 1977 resolution of the Political Committee and its link with other government committees has become stronger and more valuable. Because of its position and because certain science organizing tasks have not been carried out, operational matters in its work have garnered undue emphasis in some cases. The notable expansion in the number of people in it is holding back the ability of the committee to make decisions.

Developing research directions and coordinating important social sciences research programs has played the determining role in the work of the Social

Sciences Coordination Committee, which functions as a subcommittee of the Science Policy Committee. Strict and effective selections and evaluations, which would take scientific and social needs into consideration at the same time, are not yet realized adequately in its activity.

The planned nature of managing the research network of the Hungarian Academy of Sciences has increasingly helped direct into practical applications the work of the Academy research institutes, which is based on basic research activity. On their own initiative and at the request of state and party authorities the bodies of the Academy have given opinions on scientific and social questions of great significance in a number of cases. However, the use of interdisciplinary forms -- roundtables, ad hoc committees -- in the activity of the bodies has declined in recent years.

The OMFB [National Technical Development Committee] has taken significant initiative in recognizing and espousing future technical development and research trends. In addition to its work as a body, giving advice and preparing ideas, it works out and finances technical development programs of outstanding significance. The creation of the Ministry of Industry as an agency to guide industrial policy also changed the status of the OMFB. A division of tasks between the two administrative agencies has taken place but confusion has arisen in practical cooperation which held back the quick start of the medium-range programs. Developing technical priorities of strategic significance, developing comprehensive developmental ideas and creating the conditions for their realization are gradually coming to the fore in the activity of the OMFB.

6. In recent years we have been able to maintain the level of international scientific contacts achieved by the end of the 1970s.

The effectiveness of the scientific and technical cooperation with the socialist countries has improved somewhat, primarily in the bilateral contacts. For the time being the multilateral cooperation preserves a number of formal aspects. The government level programs are a little detached from the cooperation between branches -- and enterprises -- which has concrete goals; the latter contribute less to the solution of longer range technical development tasks. The number of visits to socialist countries has stayed at the level which had developed at the end of the 1970s; the number of longer study trips and of aspirants working abroad has decreased. As a whole we are not making adequate use of the possibilities of scientific and technical cooperation between the socialist countries.

The increase in the number of private invitations has made it possible to preserve and in places increase the level of cooperation which had developed with capitalist countries. Nearly half of the total length of study trips is on account of private invitations. This, however, makes an adequate implementation of cadre policy principles and a planned development of an exchange of experiences more difficult.

Hungarian participation in the work of inter-government organizations has increased. We have also achieved significant successes in the area of hosting international scientific congresses.

A system for national administration of international contacts has developed. The independence of the ministries in organizing and guiding international contacts has increased together with a stepped-up governmental involvement.

There has not been an adequate linking into international technology transfer. The level of license and know-how trade has not increased to any considerable extent. The volume of technological information taken over by virtue of mixed enterprises and various professional services has not reached the necessary magnitude either. In addition to the discrimination affecting the socialist countries, certain aspects of economic and foreign trade regulation make the unfolding of technology transfer through scientific channels difficult.

7. There has been no considerable progress in increasing the objectivity, demanding nature or democracy of scientific affairs. One could experience a slowdown and absence of debates. In other places the debates were often embued with subjective factors; monopolistic tendencies gained ground.

The overgrowth of the committee system embracing scientific affairs is dangerous -- the unjustified creation of more and more committees, the devaluation of committee work and the frequent overlap in the tasks of the committees. The composition of the committees and national forums has become rigid; those participating in them are relatively narrow groups of researchers, generally coming from among the leaders. The possibilities for expressing institutional, professional and societal opinion, which would activate the majority of the researchers, are less developed.

Unnecessarily few young experts participate in the work of the committees. The proportion of members under 45 years of age in the committees of the Hungarian Academy of Sciences hardly exceeds 7 percent.

The intensity and level of scientific affairs within the scientific institutions have decreased for various reasons. The scientific councils operate well in very few places. The democratic possibilities in the functioning of the director's councils are not exploited sufficiently and their activity is frequently formal.

According to recently passed resolutions the administration of the research institutes operating as enterprises will be adjusted to the changed system for enterprise management -- taking the unique aspects into consideration. It is to be expected that a need for further development will also arise in connection with the leadership of research institute management of the budget and in connection with the selection of their directors.

8. The party organizations working in the area of scientific R&D and the regional party committees at various levels have worked effectively helping execute the science policy tasks on the agenda. Recognition of the social, economic, ideological and political role of science has become accepted in the work of the party organizations. The science policy activity of the regional and institutional party organizations has become stronger, better organized and more systematic. Studies and agenda aiding and supervising implementation of the guidelines has received significant emphasis in the corporate work. They have done a lot to solve national and local science policy problems, to

increase the social prestige of scientific R&D work and to carry out the party and state decisions pertaining to a further development of the research base. Using directly the tools of party work they have supported the strengthening of the link between science and practice and contributed effectively to the mobilization of reserves. They have directed increased attention to aiding technical and agricultural R&D work.

In the course of their work, which has been effective as a whole, the party authorities have not in every case found the proper solutions for balancing the central and the local interests, due primarily to contradictions which were sharpening as a result of the narrowing of resources available. We could also find uncertainty in several questions of influencing cadre policy.

The forums organized by party organizations have played a significant role in providing political orientation for researchers and in molding public opinion of researchers.

II.

The Political Committee took note of the report concerning the implementation status of the science policy guidelines.

It established that, as a whole, R&D activity in recent years has developed effectively. It expresses its thanks and recognition to those researchers who -- with their new discoveries and their solutions to concrete tasks serving concrete economic and social goals -- have contributed to the progress of science, to the economic construction work and to developing our society.

When determining science policy tasks one must start from the position that the need for scientific R&D will increase further in the years ahead, while working out the forecasts and decision alternatives necessary for a deliberate development of society, while laying the foundations for economic development, developing and spreading new technologies, creating modern conditions for civilized and healthy living conditions and raising social awareness. In its political work and patronage the party must take into consideration a further increase in the social significance of highly qualified R&D activity.

1. Following the developments of the period after the 1977 resolution of the Political Committee and as domestic social and economic conditions have developed new needs have arisen in connection with a further development of certain areas of scientific R&D.

-- The ratio, intensity and level of basic research reflect the outstanding importance of this activity from the viewpoint of our long-range development. The conditions for this research must be ensured on a continuing basis.

-- In addition to their disclosure of reality and further development of their activity in preparing decisions the social scientists must assume greater roles in ideological work, in analyzing the theoretical and historical problems of contemporary Hungarian reality, the domestic and international experiences of socialist construction and its changed conditions. This will require an increased extent of theoretical activity, a creative application of

Marxism-Leninism, a strengthening of a critical social attitude committed to socialism and realization of the principle of research freedom and publication responsibility.

-- In planning and guiding research and technical development it must be noted that a few areas of S&T -- primarily electronics, automation and computer science, materials science and biotechnology -- have become outstandingly important factors for development. The level of their refinement and the spread of their applications will influence the status of the economy and the society as a whole.

-- When developing a system of economic conditions for the enterprises the effect of the changes on the technical development of the enterprises must be weighed with special attention.

-- The foremost tasks and tools of state science policy guidelines should be modified in accordance with the changes taking place in the area of economic management.

-- The efficiency of R&D must be aided with greater determination; the less effective or useless activity must be consistently eliminated. We can ensure suitable conditions for research groups proving their effectiveness only if we withdraw support from low-level, inconsequential research. The international judgment should be the basic standard for evaluating natural science research and effective application should be the basic standard for research with an immediate economic goal.

2. Even after the reorganizations were carried out in recent years, developing the institutional system for R&D, adjusting it to the changing goals and circumstances, is a constant task. Forming the operational conditions for the organizations and aiding self-movement stimulated by interests and motivated by circumstances should increasingly be the chief tool for developing the research base. Central intervention must serve primarily to ensure the R&D base necessary for tasks of national importance, to force back less effective activity and to provide an infrastructre of its own for scientific research and technical development.

High-level research work within the faculties is a vital condition for high-level expert training and for scientific development. Thus the development of the faculty research base must be continued -- to the extent of our possibilities. Increasing research support will be received by those faculties which prove by their achievements their suitability for performing high-level research work. Faculty work must be made more attractive for the best intellectual forces -- including those working in practice. We must overcome the refusal, experienced in some places, to bring in outside experts. The cooperation of the faculties and the research institutes must be improved, and in justified cases the faculty research base must be expanded by carrying out organizational modifications.

Strengthening of enterprise research is another chief direction for developing the R&D institutional system. It is absolutely necessary that the large enterprises themselves have R&D development laboratories suitable for

tracking down and reviewing the innovation processes in their area of activity, to take the lead, to control their products and manufacturing procedures and -- if possible -- to develop them further. Administration should help modernize the enterprise research sites primarily by means of economic and legal regulation and with special support in a few well defined areas of industrial development.

Continuing the structural transformation of the research base, the work of every research institute -- linked to the competitive area, where the R&D work with an immediate economic goal is the determining factor -- must be given an entrepreneurial character.

Cooperation based on common economic interests must be encouraged among enterprises, research institutes, technical development enterprises and organizational marketing enterprises.

Developing the internal structure of various research sites and their mutual cooperation are significant reserves for increasing the efficiency of R&D. The interest of the research sites and of the individual researchers in making use of the research results or in creating profitable independent economic enterprises utilizing them should be increased by direct and indirect means. Suitable organizational and financial frameworks for production and service activity by research institutes must be developed.

The open questions connected with the legal status of the research sites must be settled. In the course of legal regulation there must be an unambiguous determination of the function and obligations of the research institutes and of the legal status of the researchers.

The activity of the economic work associations operating in the research institutes must be regulated. Enterprise economic work associations should be formed in the research institutes primarily to introduce the scientific results that have been achieved.

3. There is no justification to increasing the personnel of the research base in the years ahead. But we must raise the quality requirements for the research activity, and we must better recognize outstanding research performance and activity in introducing the results in practice. Material recognition and moral support must be employed in a more differentiated way.

The internal scientific atmosphere of the research institutes must be improved. This should help evaluate the scientific performance and the distinction between researchers more objectively -- according to results. Directing to other careers those experts unsuitable or less suitable for research must become a natural process. The party organizations and the social agencies should require and should support such steps by state administration.

A healthy personnel exchange, increasing the ratio of younger researchers, must be created by a deliberate cadre policy. Employment after reaching retirement age, which is practically obligatory in the research institutes and faculties, must be eased off, but we must also continue providing employment after retirement age for experienced, successful researchers and teachers.

By giving leadership positions to young capable researchers we must prepare for the generation change among the mid and high level chiefs of the research institutions.

Institutional conditions must be created so that the outstandingly talented experts who work abroad for long periods of time can remain participants in domestic scientific affairs and higher education, so that they could receive moral support and just recognition at home in keeping with the accomplishments attained abroad.

4. Increasing our R&D resources at a pace that is faster than the increase in our national income will be justified for some time still. The circumstances surrounding the resource limitations and the unique nature of scientific activity in particular justify ensuring the predictability of financing conditions, increasing the institutional freedom of decision and eliminating unjustified bureaucratic restraints.

Measures must be taken to end the obsolescence of research tools. We must give our support to updating the large instruments and the instrument parks of research sites performing basic research, which constitute an indispensable condition for the competitiveness of Hungarian economy and sciences. Measures must be taken to encourage better use of the existing instrument park. Efforts must be made to increase the ratio of investment resources and instrument and equipment acquisition within the investments. Efforts must be made to preserve the real value of the budgetary support for research, ensuring the basic operational conditions for the budgetary research institutions.

5. In the past period the system of creating and utilizing scientific achievements has become an extraordinarily differentiated complex, integrating many forms of direct and indirect cooperation, manifesting various interests. If the administration is to be able to influence and manage the essential elements of this process it is absolutely necessary to divide up the state (government), enterprise (institutional) and scientific body tasks, make a distinction between them and coordinate their performance. This division of tasks must find expression in the theory and practice of the two chief tools for management, planning and financing, and in the structure of the institutional system of administration.

It is an essential condition for the effectiveness of science policy administration that it become an organic part of government's administrative activity to a greater extent. When significant government decisions are made, their effect on the process and effectiveness of research and technical development must be carefully considered.

a. The R&D planning systems and methods must be continually modernized in the chartered directions, according to our accepted principles. Appropriate balance must be created between long-range, medium-range and annual plans and programs and between national, branch and institutional plans and programs. The plan containing the long-range directions for scientific research establishes trends; its task is to influence researcher training, develop research networks and select research themes. Its periodic modification should provide broad scope for the initiatives of the scientific collectives.

The basic tool for medium-range planning is the national medium-range R&D plan (OKKFT). It would be desirable in the future for this plan to include the technical development priorities of national significance. The plan should be built on tasks and programs which contain concrete means of execution. The number of programs must be reduced from the present level. The relationshipof these programs to the central economic development programs must be made clear and we must reduce overlapping in administration, supervision and financing. The organizations responsible for managing and executing these programs should have direct control over the expenditures approved at the government level.

When developing the planning system for the social sciences more attention must be paid to the unique aspects of social science research work. The number of priority themes and the extent of the areas covered by them should be reduced so that it will become possible to concentrate resources on one area at a time. In addition there should be suitable support for and recognition given to outstanding individual research and activity of a theoretical nature.

b. In financing R&D, there must be a less ambiguous determination of what sort of tasks should burden the state budget, other central or branch funds or enterprise resources. The increasing demands placed upon the technical development of services, trade and the infrastructure make it mandatory to provide the necessary conditions for this. In addition to providing resources, the extension of credit and other state preferences (customs and tax concessions, initial price support, etc.) should encourage domestic R&D and influence it in the desired direction.

In addition to the two basic sources for research and technical development -- the budget and the technical development fund -- we should encourage increased financing through the untaxed profit of the enterprises as a third source. The government will decide about a possible modification of the presently valid system for generating the enterprise technology development fund on the basis of a general evaluation of the effects of the new generation rules introduced in 1983.

When determining the scope of the technical development sources attention must be paid to the resources needed to carry out the central tasks decided upon.

It would be useful to expand the extent of the supportfor the technical development process which is based on preferential bank credit. Developmental financial institutions which support technical development themes -- tryingto make a profit and taking risks -- should be linked into thefinancing of technical development.

The competition system for awarding supports should be expanded on the basis of the present favorable experiences and conditions should be created for fund type financing offering security for several years in developing the themes. We must ensure a more basic, public supervision of the results of research done with funds won through a competition.

c. There is no need for fundamental organizational changes in the institutional system for the administration of research and technical development. But it is justified that the organizational structure and the

division of labor should constantly adjust to the changes in economic management and state administration.

In the activity of the Science Policy Committee there must be greater emphasis on questions of theoretical significance and government tasks of balancing science policy and economic policy. Government level activity must be intensified in questions connected with the cadre and manpower management of research administration in determining the chief internal proportions of the resources planned for R&D and in developing the financial and legal rules which determine the operations of sites which have research as their chief mission. The supervisory activity of the Committee, the need to report to it, must be stepped up.

The responsibility and role of the Hungarian Academy of Sciences in national administration of basic research, in raising the level of it and in the social activation of researchers' public opinion must be increased further in the spirit of earlier resolutions. The role of the Academy in initiating basic research must be increased outside the Academy research network too. The Academy should try to establish cooperation between research institutes and faculties and develop and employ methods necessary for this.

The tasks and operations of the OMFB must be coordinated with the increasing role of technical development in economic management and in raising the technological level of the economy.

In the area of technical development the interested ministries should facilitate the organization of R&D programs serving to increase competitiveness which go beyond the possibilities and interests of individual enterprises, contributing to the development of national programs. They should provide guidance for national programs with inter-branch responsibility on the basis of government authorization.

6. Further efforts must be made to develop international contacts for Hungarian research. The value judgment based on international scientific opinion must be regarded as fundamental in evaluating scientific achievements. The level of domestic R&D depends in large measure on whether the existing system of international scientific contacts can be developed and qualitatively improved.

Considering its economic and technical development our country is basically a following country. To a large extent -- with the exception of a few branches -- the most developed technologies for updating industry, the knowledge and experience needed to operate them must be acquired from abroad. Thus it is of fundamental importance that we increasingly adopt foreign science and technology achievements and utilize them more efficiently. Direct cooperation between research institutes and enterprises in the CEMA countries must be encouraged. Suitable foundations for this are provided at the highest level by the resolutions of the June 1984 CEMA conference, which focused special attention to accelerating S&T development and to strengthening the cooperation of the socialist countries.

Progress must be made in organizing modern forms and methods of cooperation --

joint bilateral (or even multilateral) laboratories, developmental sections, temporary international research collectives, joint enterprises. S&T cooperation with developed capitalist countries must be supported for a concrete purpose. It would be useful to expand contract research work between Hungarian research sites and capitalist enterprises.

Itisof scientific, economic and political interest that we increase our participation in international scientific affairs.In addition to joint research and sending out Hungarian scientists we must extent our link to international scientificcircles by organizing international scientific congresses and conferences and by initiating the publication of joint periodicals and books.

7. The democracy of scientific affairs and a critical spirit based on the quality principle have a determining role in judging the level of scientific achievements and in aiding selection according to value. In addition to the forums of the Hungarian Academy of Sciences and the National Technical Development Committee we must increase the role of the member associations of the MTESZ [Federation of Technical and Scientific Associations] and other scientific associations in debating timely questions of scientific R&D development.

It is recommended that there be a simplified committee system covering the most varied areas of scientific affairs according to the most varied points of view and that there be an actual exercise of the committee functions thus developing. It would be desirable to avoid piling up committee leadership posts and committee memberships. Members of the younger researcher generations should be continually and to an increasing degree brought into the committee work.

The collective leadership bodies of the research institutions should have a greater role in judging and supervising scientific accomplishments and in the cadre work of the institutions.

8. The party organizations working in the various institutions of scientific R&D should assist in the realization of quality requirements and the execution of science policy resolutions by developing a suitable political atmosphere. They should step up party construction work among researchers showing quality performance -- especially among young researchers. The experienced, highly regarded Communist scientists should consider the political persuasion of young researchers, winning them to our ideals, an important task.

In the future too the bodies, committees and work groups of party organizations at various levels should deal with questions on how to help implement the science policy resolutions and supervise their execution.

Using the unique tools of party management a consistent stand must be taken to realize the internal order of scientific values, to develop a suitable age composition of researchers and to create political conditions for differentiating on the basis of scientific accomplishments.

The cooperation of the departments of central and regional party organizations must be stepped up to implement the science policy resolutions more effectively. The activity of the science policy work groups and Communist aktivs working with the regional party committees must be made more systematic. The party organizations should help differentiate those interdependent activities of the S&T development that have different functions, creating a more realistic view of the social role and the possibilities of science. They should help develop a more complex system of contacts between science and practice.

Table 1. Financial Sources of R&D Expenditures

Source	Units	1970	1975*	1980	1983
From state budget	Millions of forints	2,489.4	3,984.1	5,224.1	5,219.2
	Share, percentage	32.5	28.6	23.5	22.2
From technical development fund	Millions of forints	5,021.0	9,506.5	16,095.1	17,556.0
	Share, percentage	65.4	68.3	74.0	74.8
From enterprise results and other sources	Millions of forints	165.0	426.4	439.9	696.4
	Share, percentage	2.1	3.1	2.0	3.0

*In addition to what is listed a sum of 3 million forints was used from international organizations or other foreign sources.

Table 2. A Few Chief Indexes of Scientific Work

Category	Units	1970	1975	1980	1983
Books published	Total number	835	1,118	1,424	1,456
	Number per 100 researchers*	5	5	6	7
Articles published	Total number	13,699	16,698	19,496	22,455
	Number per 100 researchers*	84	74	76	101
Innovations submitted	Total number	3,856	6,183	4,738	5,002
	Number per 100 researchers*	24	27	19	23
Inventions submitted abroad**	Total number	624	1,647	1,639	1,434
	Number per 100 researchers*	4	7	6	6

*Recalculated for full time workers.

**Since 1972 statistical attention has been paid separately to foreign submissions and an invention submitted in several countries must be counted as a separate submission in the case of each country.

Table 3. Development of the Chief Data for Research and Development

Item	1970	1975	1980	1983
Total workers on research sites	64,419	81,289	85,356	78,388
All workers in % of active earners	1.29	1.59	1.68	1.58
Number of scientific researchers	23,721	34,798	38,705	36,722
R&D expenditures (in billions of forints)	7.7	13.9	21.8	23.5
Expenditures in % of internal use of national income	2.72	3.18	3.65	3.23
R&D investments (in billions of forints)	1.7	2.4	3.1	2.7
R&D investments in percent of economic investments	1.88	1.67	1.61	1.42
Expenditures per researcher (1,000 forints)	471.4	616.0	850.7	1,060.5
Number of research sites	1,071	1,478	1,442	1,274
Number of foreign trips	13,985	19,514	20,214	21,487
Trips per 100 researchers*	85.8	86.4	79.0	97.1
Themes being worked on	25,410	30,839	30,647	30,073
Themes per 100 researchers*	156	137	120	136

*Calculated for full time researchers.

Table 4. Structure of R&D (percentage)

Theme Cost According to Level of Research	1970	1975	1980	1982*
Share of basic research	14.3	12.3	13.3	11.6
Share of applied research	32.4	31.8	31.7	29.9
Share of developmental research	53.3	55.9	55.0	58.5

*Data for 1983 not available.

According to Organizational Type of Research Site		1970	1975	1980	1983
Share of research institutes	expenditures	50.5	54.3	55.6	37.3
	personnel*	56.8	56.1	56.8	30.5
Share of university and college research sites	expenditures	7.3	10.1	11.1	12.1
	personnel*	9.7	11.1	13.8	15.9
Share of other research sites**	expenditures	42.2	35.6	33.3	50.6
	personnel	33.5	32.8	29.4	53.6
Of this, enterprise	expenditures				47.5

*Recalculated for full time workers.

**The current statistics divide other research sites into the "enterprise" and "non-enterprise other" categories. (The latter includes museums and public collections.)

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HUNGARY

INSTRUMENTATION FOR VEGA PROJECT DESCRIBED

Budapest MAGYAR HIRLAP in Hungarian 4 Jul 85 p 8

[Interview with Andras Varga, chief of the astrophysics department of the Particle and Nuclear Physics Research Institute of the KFKI: "Target: The Comet; Results Can Be Used in Everyday Life"]

[Text] We could read recently that the VEGA space probe launched toward Halley's Comet had reached Venus as an intermediate station on its course and that its landing unit had provided valuable data about the surface of the planet, called the Evening Star, hidden from us by clouds. Since then the probe, prepared within the framework of cooperation between Interkozmos and several Western space research organizations, has plunged on through space in the direction of its target, Halley's Comet, which reaches the vicinity of Earth every 76 years. About 15 scientific devices are on board the VEGA space probe to study the comet. As is well known, Hungarian instruments also were prepared for the space experiment. I asked Andras Varga, chief of the astrophysics department of the Particle and Nuclear Physics Research Institute of the KFKI [Central Physics Research Institute], about these.

Camera for the Dirty Snowball

[Answer] We should speak of equipment prepared with Hungarian cooperation rather than about Hungarian instruments. The first is the central data collector, called the BLISI, which is the result of Soviet-Hungarian cooperation. This is service type equipment which collects various data arriving from the several on-board instruments and passes on the appropriately ordered information to the telemetric system. (It is the task of the latter to store the data as needed and then send it on to Earth.) The great majority of that part of the BLISI which fell to us was made by the microwave communications engineering faculty of the Budapest Technical University, but the KFKI also took part in the work. The device is supplied with a triple security system, which means that if one channel fails a second automatically goes into operation, and so forth. The BLISI was tested at the beginning of the trip, which was very important because without this equipment the data of all the other instruments would be inaccessible.

[Question] What does the next "Hungarian" instrument do?

[Answer] In regard to its significance we should talk next about the television system which was made partly for scientific purposes and partly for service purposes. French, Hungarian and Soviet researchers worked on its development, and we are responsible for its electronics. In addition to taking and transmitting to Earth pictures of the comet nucleus and its environment, the television system controls the platform, the movable unit containing instruments which can be extended from the lower part of the probe, which will constantly track the comet with its sensor "eyes" when passing Halley. On the platform one can also find a three-channel analyzer and an infrared spectrometer, and it is the task of the television system to aim these instruments at the speeding cosmic body, or as we jokingly call it, the immense dirty snowball. The information is processed by Hungarian electronics containing two microprocessors, which are the soul of the television system. The equipment, which counts as a technical marvel, will begin to operate only in March 1986--when it meets with Halley--although it has already been tested once. Of course then, with the platform still folded onto the probe, they only got the so-called dark current picture.

TUNDE and Solar Protuberance

[Question] Instruments for strictly scientific purposes have been made in addition to the above equipment....

[Answer] The first is the TUNDE ["Fay"], created by Hungarian-Soviet-FRG cooperation. This is a medium energy particle sensor which carries out a double task. On the one hand it registers cosmic ray events on the way out. Such, for example, was the solar protuberance on 21 January as a result of which the energy distribution and strength of cosmic radiation in interplanetary space changed. The data sensed by the TUNDE are being processed now and we can count this as the first scientific achievement of the VEGA program. The more important task of the instrument is study of the accelerated, charged particles, ions, in the immediate vicinity of the comet. The idea for the TUNDE was born in our department and the instrument was included on the probe at Hungarian initiative. As part of the cooperation we again took over the electronics, and the sensing head was made in the FRG.

[Question] Where does the name of the instrument come from?

[Answer] Well, this cannot be explained in any exact way. One of our physicist colleagues had made various special instruments some time ago and in a curious way he gave each a woman's name. So now TUNDE is part of this series.

[Question] What is the task of the instrument called the PLAZMAG?

[Answer] This is a plasma analysis device. Plasma, also called ionized gas, arises when an electric discharge strips from atoms the electrons orbiting around the nucleus. This also happens on the surface of a comet and the PLAZMAG measures the characteristics of the cosmic plasma currents partly from that and partly from the Sun. Soviet researchers made the sensors of the instrument and we made the electronics. But there are also neutral gas molecules in the vicinity of Halley and the ING equipment was made for their

mass distribution. The ING makes up a unit together with the DUSMA cosmic dust analysis instrument. The idea for this latter comes from the Chicago University, so Americans as well as Soviet and FRG researchers took part in the development of this instrument. We made the earth control unit for the ING-DUSMA complex. Every single VEGA instrument is controlled by some special device on Earth, which is usually much more complicated than the device on the probe itself.

Competition Measured in Kilograms

[Question] How extensive is the work of the Hungarian experts compared to the other nations in the VEGA program?

[Answer] It may sound strange at first hearing, but in general the instruments going on the space probe are measured in kilograms and liters. But if we think about it more it becomes understandable, because here mass and volume are terribly important, and since a number of developmental groups would like to put their own instruments into the limited space available on the probe the question of space requirements plays a role in the noble "competition" also. Taking everything together, however, Hungary did the most after the Soviet Union and France. It also shows the significance of the Hungarian participation that one of the two vice chairmen of the international scientific technical committee leading the program, involving some 10 countries, is Academician Ferenc Szabo, director-in-chief of the KFKI. The results achieved in the VEGA program mean a lot for the prestige of Hungarian science on the one hand and on the other hand we learned through it how to manufacture space instruments and the peak technology mastered in this way is giving a boost which we can exploit in everyday life and in making instruments used in terrestrial research as well.

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REGULATIONS ENCOURAGE USE OF INNOVATIVE DEVELOPMENTS

Budapest MAGYAR HIRLAP in Hungarian 9 Jul 85 p 7

[Interview with Dr Dezso Sugar, department chief in the Ministry of Financial Affairs, by Marion Szluka: "With Equal Chances, Closer to Practice: Conversation on Technical Development Regulators--Interest Without Market Constraints"]

[Text] Sometimes the material interest system does work on the domestic market to encourage practical use of scientific innovation, but this does not yet count as such a strong market constraint that users are jumping after R&D results. Previously a few regulatory elements even held back technical development. How is this seen by someone who makes the rules; with the pertinent regulators modified, to what extent have chances increased for a moderation of our technical and--of course--economic backwardness? We talked about this with Dr Dezso Sugar, department chief in the Ministry of Financial Affairs.

[Answer] The modified regulator system encourages primarily the practical introduction of new technical achievements; it is adjusted on the one hand to general economic regulation and on the other hand to the organizational changes already begun in the research network. The key question was that the new regulation should not take place on a subjective basis but rather that the advantage should be given to technical development itself--independent of organizational affiliation. This was done; an end was put to certain privileges enjoyed, for example, only by research institutes or technical development enterprises and not by similar units at producing enterprises. I might also say that we have reached a sort of "natural state" in that we have put all managing units in this area at the same starting position.

[Question] How were you able to adapt to the unique aspects of technical development within general economic regulation?

Obligations Became Obsolete

[Answer] We achieved this by working out a separate regulator system within the general regulator system. We had to harmonize the special characteristics of technical development--the greater risk, the longer throughput time--with the general requirements and with the idea that the economic environment

should encourage innovative enterprise behavior more than it had. Technical development must have a salient role in improving the ability of enterprises and cooperatives to produce income. The managing units have much more freedom in this regard than a few years ago....

[Question] But perhaps the independence in this area is still not great enough. In communications engineering, in the pharmaceutical and instrument industries and in a few sub-branches of the heavy chemical industry, for example, they still prescribe centrally an obligatory generation of the technical development fund. Why is this necessary?

[Answer] We also see that this sort of central obligation is passe. So for a time already we have gradually narrowed the circle of those branches where we have prescribed the generation of an obligatory technical development fund. Since it is our favorable experience that in many places--where they already decide this question independently--they frequently save and use for development a sum even surpassing the centrally prescribed minimal keys, realizing the long-range interests of the enterprise by thinking of the future, we will continue this process in the more research intensive industrial branches also. For example, obligatory fund generation ended this year in the metal mass goods industry, in the manufacture and processing of synthetic chemical fibers, in the household and cosmetics industry and in the sub-branches repairing transportation vehicles. And in the course of the Seventh 5-Year Plan centrally regulated fund generation will end in additional branches as well.

Share of the Profit

[Question] At the beginning of our conversation you mentioned that the most important change was working out a uniform income regulation and preference system for technical development.

[Answer] So it is. The essence of this is that the enterprises have an interest not only in the one-time sale or purchase of the developmental achievements but rather spreading them further. For example, the tax concession can reach 75 percent of the general profit tax as a function of the effectiveness of the commissioned work, that is on the basis of the gross receipts. I believe this fact speaks for itself. In addition the managing units can take advantage of the possibility of accelerated amortization. The director can increase the amortization norm on his own authority, on the one hand within the general amortization system and in addition--going beyond this--for research equipment, or--if agreed to in a contract with the customer--he can write off the entire value of a fixed asset at once, as value depreciation. Previously 40 percent of the write-off was withdrawn; this year the centralization of amortization was completely eliminated, so the entire sum can be used to renew fixed assets and supplement equipment. A close linking of science and research with practice is a general requirement, and it is characteristic primarily in industrially developed countries.

For this purpose we have worked out an interest system in which the developers have an economic interest in the spread of the achievements, in their practical introduction. A profit sharing deal ties institutional and personal

interest to the practical use of new technical achievements and to a direct share of the profit. Recently every managing organization has been able to sign such a profit sharing contract on the basis of which the party doing the research gets a share of the profit arising with the party commissioning the research. The profit shares can be used primarily to reward the workers who took part in the practical realization of the achievements. I might mention that with the introduction of the uniform income tax system the production tax for technical development enterprises ended. Enterprise type research institutes are exempt from the property tax and the technical development enterprises pay 50 percent of the generally prescribed rate, that is 1.5 percent.

[Question] If I might add a note to the profit-sharing form. Practical experts consider it a good solution even if it is their opinion that it is not easy to find a common denominator for their interests with the manufacturing enterprises....

[Answer] The success of this depends simply on market cooperation.... But let me say that even earlier there was an internal conflict of interest between innovators and the collective in regard to the innovative work connected with technical development. Namely, the innovators' prizes had to be accounted for at the burden of wage costs or the shares fund. We have succeeded in changing this as well. According to the decision of the leader of the managing organization, the source of the innovators' prizes can be the interest fund, although we have left wage costs as a possibility too. However--this is a new concession--if the innovator's prize is paid to the burden of wage costs then this does not have to be taken into account when calculating earnings.

Greater Support

[Question] Research and development bringing immediate economic profit quite properly stand in the forefront of interest, but it is also quite justified to ask what is happening with basic research, which lays the foundations for the future?

[Answer] Although I myself am dealing with the questions of technical development, I agree with those who say that basic research deserves a good bit greater attention than it is getting at present and that it deserves greater support--of course differentiated on the basis of priorities.

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DEVELOPMENT OF MORE MARKETABLE SOFTWARE URGED

Budapest FIGYELO in Hungarian 20 Jun 85 pp 1, 6

[Article by Gitta Takacs: "Software Trade: Initial Steps"]

[Text] The value of software reaches 80-90 percent in computer systems of "only" the fourth generation, already widespread in developed countries. The value of the domestic computer equipment, largely still third and sometimes "third and a half" generation, is more than 27 billion forints. At the beginning of 1984 the market value of the software in use was estimated at 3 billion forints and the increase last year came to at least one billion forints. Thus we have taken only the initial steps in the process of "upgrading" software, making it into a commodity or commercial product.

Software is a "confidence" article--its value and utility do not appear clearly at the time of purchase or even testing. The confidence of the customers can be gained with good references and precise fulfillment of the requirements (time limits, quality, guarantees). The reputation of the developer or the trading firm counts for much, but the semi-official professional evaluations appearing in some places (for example, in the journal DATAMATION) have a role also.

In our country almost 50 large organizations and a number of small entrepreneurs are dealing with basic software marketing. They supply the heterogeneous domestic computer park of about 400 types.

In the period ahead the number of machines belonging in the uniform computer system (ESZR) and uniform minicomputer system (MSZR) of the CEMA countries will probably increase by 40-50 per year. Even taking into consideration the basic software needs accompanying an expansion of configurations the trade in this area is most restricted or limited. The Computer Technology Applications Enterprise (SZAMALK) and the Central Physics Research Institute (KFKI) play the fundamental role in supply. About 20 percent of the software trade of SZAMALK and 40 percent of that of the KFKI come from basic software.

The price of the computer systems imported from the socialist countries includes the basic software, but the operating systems delivered (and paid for) with the machines are rarely used because they are unreliable and how to follow up on them has not been solved. Since the ESZR machines are IBM

compatible they are generally operated with operating systems purchased or leased from IBM or from a domestic intermediary (for example, the National Software Archives and Follow-Up Service).

Use of uniform basic software elements is the foundation for series manufacture of applications programs. If two identical computers work with different operating systems then an applications program written for one of them can be run on the other machine only after transformation and adaptation.

Development of so-called standardized framework systems for the ESZR machines began in 1981; these consist of IBM operating systems and domestically developed or ESZR software elements. The second series ESZR machines (well known under the designations R-15, R-35, R-45 and R-55) almost all work with such basic software. But the more than 30 institutions using such computers are not always satisfied with the quality of the services (courses, instruction, documentation).

The situation is different with software standardization for the minicomputers, largely because there has not been adequate coordination of the professional and business policy work of institutions dealing with the spread of domestic MSZR operating systems. The situation is complicated by the fact that because of the relatively low price of minicomputers they are generally going into places where there are not yet computer technology traditions and no experts who know how to solve software problems quickly and well. Software follow-up is not adequately organized or adequately reliable.

There Is Something...

According to international experiences it is necessary to produce or purchase one third of a unit value of software for mini or larger computers per unit value of computer technology device investment; this figure is one unit or more for microcomputers. As an average here 20-60 percent of the original price of the software is turned to maintenance or modification during a 4-5 year life cycle.

In the trade in user programs only 30 percent is a repeat product, that is one not being sold for the first time. Software developments being prepared for a single order are the rule on the domestic market. In general each product is used in only one or two places. In recent years a number of enterprises (Comporgan, System House, the Struktura Organizational Enterprise, the EGSZI [Institute of Construction Management and Organization]) have tried to produce so-called standard software, but these products are not yet flexible enough--compared to the characteristics of the hardware--and there are problems with follow-up; only a few of the desired online operating mode modules have reached the market. (In order to end the shortage of conversational mode enterprise software built on modern organizational principles the KSH [Central Statistics Office] has purchased such products from England to distribute domestically. See FIGYELO, No 22, 1985.)

The standard software which has been developed covers only a small part of the individual applications. Manpower and intellectual capacity are cheap, so sooner or later the enterprises develop their own programming staff for the

ESZR/MSZR and other machines acquired, and they develop the software needed for processing. Many programs for a single use have been developed and are being developed in the country; the intellectual product embodied in them is only rarely used again; if the developed software is to become a commercial product it needs something a little "extra"--it must be supplemented for general use, the "packaging" has to be higher quality, there has to be suitable documentation. This last is a very weak point. A well known expert has said: "Even today the most valuable document for many computer center leaders is the little notebook which contains the telephone numbers of programmers who have left the enterprise; lacking good documentation, only the person who made it originally knows how to repair a program."

The growth in computer applications is faster than that of software development capacity, so a demand is growing for good quality software which can be used widely and has a suitable service background.

There is not only a shortage of software products on the Hungarian market; quite a few of the conditions for quality trade are missing as well. There is a shortage of reliable, objective software trade information; there are very few intermediaries or agents who would give bids and advice to an uninformed user. The customers look up the software houses directly, where they undertake ad hoc developments, usually more expensively than if the customer had purchased a finished product elsewhere.

The creation of the Softinvest software trade association can be viewed as a first step in developing an infrastructure or mechanism for software trade. (Software also represents an ever increasing share of the trade of the Joint Enterprise for Marketing Computer Systems--Szamrend--which was formed in 1982.)

We should have more software exchanges; the number of catalogs and price lists is increasing, although these publications cannot be called complete. In the fall of 1983 they did have an exhibit called "Software '84" and this will be followed this fall with "Software '86", although it is rather difficult to introduce a software product at an exhibit, the best introduction is a good reference.

The lack of a qualifications system is felt very much. (We might compare this to the Forum for Outstanding Products or to the Quality Control Institute which examines electrical products.) This would classify and evaluate software products according to definite criteria--the level of realization, documentation, the constituent elements, the accompanying services--and do comparative studies among programs with similar functions.

The software people have received certain financial regulations with grumbling also--for example, the accounting requirement which prescribes that if a software product is prepared on order but the producer retains the right of repeat sale or wants to sell it to another then he must record the product as inventory at 50 percent value. In general, however, those trading in software only undertake commission sales, because they do not have enough capital to buy, or because they do not want to stockpile anything and take the risk.

An 11-percent consumer's turnover tax must be paid on software products and computer technology data products. A tax does not burden services offered for software. This is a good loophole, because one does not have to be too clever to see that software development can be accounted as a service or as research and development, because the boundaries merge to that extent.

Market That Should Be Stimulated

According to KSH data 1,288 microcomputers were being used by institutions in 1982, 3,257 in 1983 and 8,121 in 1984. The number of additional personal computers brought in via tourist trade is 40,000-50,000. So software is needed (or should be needed) for this many machines.

A recently published catalog provides information on more than 500 microcomputer programs from 54 suppliers, and this does not indicate all the spontaneously developed software products. Most of the programs were written for the Commodore 64 personal computer (for example, the Novotrade Company offers 120 products for this type of machine); of the professional microcomputers, the users of the M08X and Proper machines of the Computer Technology Coordination Institute (SZKI) have the most choice--among more than 100 software products. The OSAK [National Software Archives and Follow-Up Service] already supplies the program packages offered by it with a quality trade-mark.

In the past year and a half about 25 special shops have opened where one can buy microcomputers, peripherals, accessories and software. An association of APISZ [State Paper Industry Cooperative] and SZAMALK is preparing to develop a national network of shops similar to the ASZ shop in Budapest. Skala, Ramovill, the Fotoelektronik Cooperative and the BAV [Commission Retail Store Enterprise] sell many copies of micro software, the SZUV [Computer Technology and Business Organization Enterprise] has opened a shop, the Creative Youth Association is advertising its wares....

An article in the MIKROSZAMITOGEP MAGAZIN characterizes the situation thus: "According to our surveys 800-1,000 software products for professional computers are being sold. The software market is characterized by such a degree of decentralization of developers and vendors that the user does not even sense the supply.... The most sensitive point of the software market is the lack of user interest protection and the quality risk."

Although the figures indicate rather many programs the supply and demand have different structures.

In any case one can see even from the sales data for software products a tendency--characteristic elsewhere in the world as well--for small organizations bringing together well trained experts to make an ever greater part of the applications software. According to a sampling estimate--since there is no collection of statistical data pertaining to this--about 40 percent of the sales receipts of the small cooperatives, economic work associations, etc. comes from software sales. In 1983 the small organizations had only about 35 percent of the software market; in 1984 they had more than 60 percent.

Price Ratio Changes

In contrast to what is characteristic of the capitalist world market, the computer technology trade of the socialist countries is strongly hardware-centered. The volume of independently delivered software is dwarfed by that of hardware. The price of the latter is falling greatly on the world market; that of software and related services is not.

Software is a commodity, and this is already recognized in the computer technology cooperation documents of the socialist countries. But everyday practice is still far from this. For the time being it is characteristic that the price of a computer system contains a part of the basic software together with the hardware, as an accessory to the computer. Because of this "built-in" character one actually cannot give precise data about software trade among socialist countries. (Up to the end of the 1960's this was the practice in the capitalist countries too, then they detached the hardware and sold the software separately. IBM initiated this policy and the other manufacturers followed.)

Changes can be expected in the practice of the socialist countries too; attempts have begun to separate the basic software and the hardware. The price of machines is decreasing and sooner or later the software will come forward from the hardware and become independent. Since Hungary is a net hardware exporter this process will cause losses to our computer technology manufacturers, so for this very reason the ratio of software in computer technology systems sold in socialist countries should be increased.

The chief domestic computer technology shippers (Videoton, MOM [Hungarian Optical Works], the Telephone Factory) ship hardware (computers and peripherals) almost exclusively, and here also the basic software is part of the price of the computers. The industrial manufacturers do not really exploit the achievements of the larger domestic software makers, such as the SZKI, SZAMALK and Comporgan. This phenomenon is similar to the problems with the industrial introduction of research achievements. It may be that the software development firms should be made interested in and should be linked into increasing the software content of socialist export. One of the chief markets is the Soviet Union and one might think especially of the new, modern programming languages (PROLOG, Ada), engineering design systems and special applications systems for personal computers. (Sale to the Soviet Union of an interpreter program for the Ada language developed for ESZR machines represented an export worth about 1.5 million rubles in 1984.)

Trading in software as an independent product is still very much in its initial stages among the socialist countries. There are no methods for appropriate price generation--simultaneous use is being made of work expended, work required and consultant fee prices and of comparable prices for analogous products--and there are few conditions for software follow-up. (For example, the customer service offices working in the capitals of the socialist countries strengthen the market position of Videoton; the Prague office does considerable development and marketing.) Software trade is also held back by the fact that software does not appear as a separate item in the quota trade in computer technology products.

If we look at what the socialist market has to offer for Hungary we might think of basic software elements and general applications programs. Because of the differing regulatory systems the various enterprise management and guidance programs cannot be used here, and in the development of standard applications software the other socialist countries are struggling with the same difficulties as we. So for the time being supply meets demand only in a narrow area.

Hard Commodity

Right now Hungarian software has a good reputation on the Western market, thanks to a few outstandingly successful, really world level products. For example, the PROLOG logic principle programming language software of the SZKI has made a "career" for itself in the world; this is linked to research on the Japanese fifth generation computer project. PROLOG systems have been sold in Japan, America and Western Europe, in almost 100 places. The Novotrade Company has broken into the world front rank with its microcomputer game software -- "Chinese Juggler", "Caesar Cat" and others. Its creative groups include artists, musicians and gagmen in addition to programmers. The Graphisoft GMK [economic work association] has attracted notice on the capitalist market with its architectural design programs. And SZAMALK and the SZKI can count on an international success with their Softing system--prepared jointly with the West German Software Engineering GmbH.

But it must be mentioned also that in many respects the present economic environment does not facilitate an increase in software export. Software which will be successful in the world requires not only intellectual work but also reliable, modern hardware. The foreign trade authorizations sometimes drag on for months....During this time the price of a microcomputer could be returned many times over from--for example--the game software produced on it. The developmental firms also complain that they do not have the strength or the capacity to deal with the tasks which might pay off in 4-5 years, which might bring a large income then.

And finally we should consider the opinion of a foreign trade leader: The computer technology enterprises cannot even imagine how many software development tasks might be brought to them by the export partners of the Hungarian industrial enterprises....

As a result of the undeveloped nature of domestic software trade the Hungarian developers are not really making software into a market product; the follow-up and guarantees are especially deficient. This also may explain why for the time being we are exporting "naked" software, software makers, in a good bit greater ratio than completed products.

Convertible accounting software export is increasing year after year; in 1984 it exceeded 4 million dollars; but even this amount is not too great and is only a few percent of total software sales. It is true that at the present rates of exchange software can be exported very profitably. These jobs do not mean the selling off of the programming capacity needed here at home, and their significance cannot be identified with the dollar receipts alone; rather, in this way the programmers can get the experience, practice and

information--in a computer environment a good bit more developed than the one at home--which can be turned to profit here at home too, to the extent that the domestic supply of hardware and the customs or work culture here at home permit.

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CSO: 2502/62

OFFICIAL INTERVIEWED ON NUCLEAR WASTE DISPOSAL

LD161355 Budapest Domestic Service in Hungarian 0400 GMT 16 Jul 85

/Text/ It is worth mentioning that the treatment of radioactive materials, which sounds extremely frightening for most people, and sometimes sparks off passions abroad, has been taking place in a reassuring manner in our country for a good number of years, without any particular fuss.

/Begin recording/ /Szikra/ This site has been in operation for 9 years now, between Kishnemedi and Puespoekszilagy has there been radioactive pollution in the area in the past 9 years?

/Feher/ I would not say 9 years, because the Budapest Public Health and Medical Coinic for Contagious Diseases has dealt for exactly 25 years with the collection of Hungary's radioactive wastes, and I can say that during the past 25 years, radioactive pollution of the environment has never occurred.

/Szikra/ Or it could not be shown?

/Feher/ No. Our measurement methods are so sensitive, that if a nuclear explosion in the atmosphere is carried out in any part of the world, we are able to measure the radioactive pollution that reaches here. At the same time, not one single sample of 25,000 checks done over 25 years has shown radioactivity which might have originated from our activity. Unfortunately, radioactivity has originated from the experimental nuclear explosions in the atmosphere, and polution from natural radioactive materials occurs everywhere.

/Szikra/ From where in the country are radioactive wastes transported to this site?

/Feher/ All the waste of our country's radioisotope consumption comes here, the waste of the nuclear reactor (?in) the csilleberc establishment, and more recently, the solid radioactive wastes created at the Paks Nuclear Power Station, until Paks finds another solution for the disposal of its own waste.

/Szikra/ What do you do here with these wastes?

/Feher/ We process some of the radioactive wastes. In the case of other wastes, for example, solid wastes, we do not process them, but we bring them here to the site, and place them in cases of reinforced concrete.

/Szikra/ What are the guarantees, that is, on what basis do you state that this site has been safe not only in the 9 years which have elapsed, but it will be so in the following years too?

/Feher/ We must ensure the protection of the environment for a very long time. This means that it is necessary to ensure safe storage conditions for 500 and in some cases several thousands of years. We have made cases of reinforced concrete. The radioactive wastes packed in barrels or sacks are put in these. We fill up the areas between the wastes. The radioactive /words indistinct/ with liquid concrete; it solidifies. After this, we place panels of reinforced concrete on the waste, then a 10-cm concrete layer, water-insulation, insulation formed by concrete, a 1-meter clay layer, and apart from that, we ensure that rain water is drained off. /end recording/

CSO: 2502/61

BUDAPEST NOTES 'IMPLICATION' OF INCINERATOR PLANNED FOR DOROG

LD181027 Budapest Domestic Service in Hungarian 0430 GMT 18 Jul 85

/Text/ The construction of a new incinerator works in Dorog is an issue that goes back a long time even though the national media have only just begun to give it wider publicity. It is a controversial issue because, apart from the construction plans, the residents of Dorog have not been told anything about the implications. For one thing, people are wondering why another source of pollution should be located in a town that is already choking to death with dust, stench, and various gases. The relevant authority has now apoligized to the residents and, as Magyar Hirlap writes a whole series of open forums are now being held at which the concerns of the inhabitants and the interests of the administrative authorities can come into direct conflict. The Dorog plant, which would cost 1.5 billion forints to build with an annual capacity of handling 25,000 tons of pharmaceuticals waste, is designed to be the first in a national network of plants dealing with dangerous waste products. However, the first reason for the inhabitants' outrage is the planned construction of the plant within the town itself in the neighborhood of residential areas. The plans disregard the legal requirement of a minimum distance of 1,000 meters between the plant and residential buildings. The original plan envisaged a distance of only 500 meters; the authorities are now prepared to increase the distance to 700 meters at an additional cost of 100 million forints. Officials claim that the plant cannot cause a major disaster because the waste products would be stored in safe bunkers. They go on to note that in Zurich, for instance, there is an incinerator near residential areas and it has never caused any problems.

However, people respond by asking why they should now believe the promise of safety of operation when in the course of earlier industrial development projects the regulations designed to protect the environment were flouted one by one. The first public debate has ended without the inhabitants being convinced and the local council has not so far granted a planning permission. There has been some advance; the National Planning Office has declared that the investing company must guarantee that the incinerator will not pollute the environment. Another promise made at the public discussion was that from 1988 the air would become cleaner in Dorog. Meanwhile, the debate about the incinerator plant will continue.

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HUNGARY

BRIEFS

MEETING OF PLASMA RESEARCH COUNCIL--Latest results of plasma research will be presented at the XVII international conference of plasma physicists which is being held in Budapest this year from 8-12 July. The conference is being organized by the Lorand Eotvos Physics Society and the Central Physics Research Institute. The sponsor is the Hungarian Academy of Sciences supported by the IUPAP, URSI and Tungsram. An attendance of 400 physicists is expected. Among the 30 invited guests is Nobel Prize winner H. O. G. Alven, a Swedish scientist. More Hungarian physicists have been concerned with plasma physics lately despite previous research success in certain fields. Internationally notable results have been achieved in theoretical plasma physics at Lorand Eotvos University, in light sources and lasers at Tungsram, in development of high temperature plasma and lasers at the Central Physics Research Institute, in the study of electric arcs at Budapest Technical University, in MHD generators and investigation of arcs at the Electric Industry Research Institute. Hungarian researchers, including physicist Dr Jozsef Bakos who is member of the scientific committee for coordinating international scientific cooperation in plasma research, will present original research results at the meeting. [Text] [Budapest NEPSZABADSAG in Hungarian 4 Jul 85 p 4]

REPORT ON COMPUTERS--Budapest, 5 Jul (MTI)--There are over 1,300 computers operating in Hungary today, one-third in industry and the rest in the services and administration, or in agriculture. Two-thirds of the computers are in Budapest. There are nearly 25,000 people in the country whose work is related closely to computer technology. That figure has doubled in the past 10 years. In addition there are some 10,000 people working in small-scale cooperatives and specialized groups within co-ops, as well as over a thousand people in private working communities involving computerization. The output of the sector is close to 9 billion forints. For instance, last year 700 software programs were made in Hungary, to a value of over 800 million forints. In addition there are 8,500 mini and microcomputers that are owned by companies, cooperatives and schools. It is estimated that there are 50,000 home and personal computers in the Hungarian households, ranging from the simple models which can be used as toys only on through valuable models with a wide range of peripheries. /Text/ /Budapest MTI in English 1707 GMT 5 Jul 85/

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